

REMARKS

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding office action is respectfully requested.

Claims 16-19, 25-38 and 40-45 remain in this application. Claim 39 has been canceled. Applicant believes that no new matter is added to the application as part of this response.

1. Amendments

Claim 16 has been rewritten to more clearly recite that the substrate remains not H₂-loaded during the step of focusing the beam therein. Similarly, claim 25 has been rewritten to more clearly recite that the glass body remains not H₂-loaded during the step of positioning the focus of the laser beam therein. Support for this limitation is found throughout the Examples, as well as at page 3, lines 7-25.

Claim 25 has been rewritten to recite that the raised refractive index waveguiding core is clad in all directions perpendicular to the axis of the waveguide core by the composition of the interior of said glass body. Support for this limitation is found throughout the specification as filed (see, for example, FIGS. 9A-9E).

Claims 16-19 have been rewritten to recite a glass substrate instead of a bulk glass substrate. Claims 40 and 41 have been rewritten to more clearly recite that at least part of the core of the waveguide is at least 1 cm from each surface of the glass substrate or glass body. Claim 42 has been rewritten to recite a glass substrate. Claim 44 has been rewritten to more clearly recite that the glass substrate is free of germanium.

2. Claim Rejections - 35 U.S.C. §112, second paragraph

The Examiner has rejected claims 16-19 and 25-45 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Examiner noted that the independent claims have been amended to recite that the glass body or substrate is not hydrogen loaded, but pointed out that the desirability of hydroxyl content in the glass “indicates that Applicant wishes there to be hydrogen in the glass composition”.

The independent claims have been rewritten to recite that the provided glass (i.e., the glass body or substrate) is not H₂-loaded; and further that the glass remains not H₂-loaded during the step of exposure to the laser beam. Since the claims now recite

molecular hydrogen (H₂), it should be clear that hydrogen atoms present in hydroxyl groups are not intended to be encompassed by this limitation.

The Examiner has asserted that “one of ordinary skill would find it impossible to determine what sort of hydrogen-introductions techniques infringe (if any), and what sorts of hydrogen-introduction techniques do not infringe.” Applicant submits that the skilled artisan would understand the meaning of H₂-loading in the claims as amended. H₂-loading is a well-known technique for increasing the photosensitivity of certain glass materials. As the skilled artisan would understand the term, H₂-loading is a process in which molecular hydrogen is diffused into a consolidated glass article at high temperatures and/or pressures.

The Examiner has objected to the term “bulk glass substrate.” Claims 16-19 have been rewritten to more clearly recite a glass substrate.

The Examiner has noted that there is no antecedent basis for the term “the silica-based glass” in claim 44. Claim 44 has been rewritten to more clearly recite that the glass substrate is free of germanium.

Claim 39 has been canceled, rendering moot the rejection thereof.

3. Claim Rejections - 35 U.S.C. §112, first paragraph

The Examiner has rejected claims 39-41 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 39 has been canceled, rendering moot the rejection thereof.

Claims 40 and 41 have been rewritten to recite that at least part of the core of the waveguide is at least 1 cm from each surface of the glass substrate or glass body. Applicant submits that the claim, as amended, is supported by the teachings of the specification (for example, FIGS. 9A-9E).

4. Claim Rejections - 35 U.S.C. §102(e) - Cocito

The Examiner has rejected claims 25, 34 and 37-38 under 35 U.S.C. §102(e) as being anticipated by Cocito (U.S. Patent 6,209,356).

Claim 25 has been rewritten to recite that the waveguide core is clad in all directions perpendicular to its axis by the composition of the interior of said glass body. In Cocito, a strut of raised refractive index is written through the core of an optical fiber

with UV radiation in order to provide a polarization-maintaining fiber. If both the core and the cladding of Cocito's optical fiber are taken together to be the 'interior of the glass body' of claim 25, when the interior of the glass body does not have a homogeneous composition. Alternatively, if only the core of Cocito's optical fiber is taken to be the 'interior of the glass body' of claim 25, then the raised refractive index region is not clad in all directions perpendicular to the axis of the waveguide core by the interior of the glass body; on two sides, it is clad by the cladding layer of the optical fiber, which is not part of the 'interior of the glass body.' In either event, the raised refractive index regions formed in the optical fiber of Cocito are not waveguiding cores, as required by claim 25; rather they are raised refractive index features created to form a desired degree of anisotropy in the overall optical fiber core. As such, Applicant submits that Cocito does not meet each and every limitation of rewritten claim 25, and that claim 25 is therefore not anticipated by Cocito.

Claims 34, 37 and 38 depend ultimately from claim 25; Applicant submits that they are patentable for at least the reasons described above with respect to claim 25.

4. Claim Rejections - 35 U.S.C. §103(a) - Cocito

The Examiner has rejected claims 26, 29-33 and 35-36 under 35 U.S.C. §103(a) as being unpatentable over Cocito (U.S. Patent 6,209,356). Claims 26, 29-33 and 35-36 depend ultimately from claim 25. As such, they now include the limitation that the waveguide core is clad in all directions perpendicular to its axis by the composition of the interior of said glass body. As described above, Cocito neither teaches nor suggests the formation of a waveguide core clad in all directions perpendicular to its axis by a homogeneous composition. As such, Applicant submits that claims 26, 29-33 and 35-36 are patentable over Cocito, and requests that the rejections thereof under 35 U.S.C. §103(a) be withdrawn.

5. Claim Rejections - 35 U.S.C. §103(a) - Atkins

The Examiner has rejected claims 16-19, 42-45, 25, 27-31 and 35-36 under 35 U.S.C. §103(a) as being unpatentable over Atkins (U.S. Patent 5,287,427).

Claim 16 has been rewritten to recite that the the glass substrate remains not H₂-loaded during the focusing step. The disclosure of Atkins is directed toward processes that require a H₂ (or D₂) loading step (see, for example, col. 2, lines 35-68; and claim 1). Atkins teaches the skilled artisan to increase the photosensitivity of a glass material by a

H₂ loading step. Conversely, the present inventors have found that the H₂ loading step is not needed in order to write waveguides into glass substrates. Applicant submits that the step of focusing the beam into a substrate that is not H₂-loaded is neither taught nor suggested in Atkins, and that claim 16 is therefore patentable over Atkins. Claims 17, 18, 42 and 44 depend from claim 16, and are likewise believed to be patentable over Atkins.

Claim 25 has been rewritten to recite that the glass body remains not H₂-loaded during the step of positioning the focus of the laser beam in the glass body. Atkins teaches the exposure of a H₂-loaded glass body to UV radiation, but does not teach or suggest the exposure of a non H₂-loaded glass body. As such, Applicant submits that claim 25 is patentable over Atkins. Claims 27-31, 35, 36, 43 and 45 depend from claim 25, and are likewise believed to be patentable over Atkins.

6. Conclusion

Based upon the above amendments, remarks, and papers of record, Applicant believes the pending claims 16-19 and 25-38 and 40-45 of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests reconsideration of the pending claims and a prompt Notice of Allowance thereon.

Applicant believes that no extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. §1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to James V. Suggs at 607/974-3606.

Date: 5-28-03

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James V. Suggs

Name of applicant, assignee, or
Registered Representative

[Signature]
Signature

5-28-03
Date of Signature

Respectfully submitted,

CORNING INCORPORATED

[Signature]
James V. Suggs
Registration No. 50,419
Corning Incorporated
Patent Department
Mail Stop SP-TI-03-1
Corning, NY 14831